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DISTRIBUTION OF CAREX AGGREGATA IN THE PHILADELPHIA REGION

BY BAYARD LONG

Of new species in *Carex*, proposed in recent years, few have been more instrumental in clearing up long-standing difficulties in a critical group than *Carex aggregata* Mackenzie, of the *Muhlenbergianae*.

The describing of new species in groups acknowledged by all students to be difficult does not always meet with general approval, however, especially where certain of the species are rather commonly recognized as not being formed of a thoroughly consistent series. The reason is patent: a group is often made even more confusing and difficult for practical use than before. Certain well-known genera of the Rosaceae (in its more comprehensive sense), which have figured largely in botanical literature in late years, come to mind. But when a form is as well differentiated as Mr. K. K. Mackenzie's *C. aggregata* we can have no criticism about "close splitting," but only appreciation of the author's close and careful study and the benefit accruing to the science by this competent understanding and solution of a troublesome problem.

The mute evidence on the labels of the plant now known as *Carex aggregata*, from the Philadelphia region alone, is sufficient to show that critical work in segregation has long been needed among the allies of *C. Muhlenbergii*. There need be selected from the Herbarium of the Philadelphia Botanical Club only three sheets to find that the gamut has been run all the way from *Muhlenbergii*, *sparganoides*, and *cephaloidea* to *alopecoidea* and *conjuncta*. This material has passed through the hands of some half-dozen botanists, all men more or less well known to botanical literature, and amply demonstrates, I think, the difficulty experienced by the older botanists in naming Carices of this alliance.

My acquaintance with the plant dates from 1909. June 19, near Fern Rock Station in Philadelphia, I have the distinct recollection of finding on a thicket margin a sedge with rather the habit of what we now know as *Carex normalis*—but very evidently belonging to the allies of *C. Muhlenbergii.* The long, lax culms and soft, broad and spreading leaves of this strange plant were very different from the stiffly erect, wiry habit of characteristic *C. Muhlenbergii,* but the spikes were rather similar. The impression of this plant was deepened by two days later finding the same form frequent in similar habitats near Frazer in Chester County. Again, the following day, along the Conestoga Creek above Lancaster in the county of the same name, two colonies were seen—one, of plants quite like those at Frazer and Fern Rock, with the spikes of the head (except the uppermost) slightly separated; another, with a somewhat shorter, closer head. I had the courage to name the last *C. cephaloidea,* but, though all these plants of the previous several days' collecting apparently had to be put into this same species, there was found more than one discrepancy between my plants and the manual descriptions of *cephaloidea;* while the specimens under that name in several herbaria consisted of a very patently heterogeneous series.

Curiously enough, after seeing this plant on three almost successive days in 1909 in three widely separated localities, I did not meet it again for three years.

On June 2, 1912, while being guided over some interesting country along Darby Creek above West Chester Pike by Mr. Charles S. Williamson, the plant was found again. This station is near Adele in Delaware County, Pennsylvania. Five days later the margin of the wooded slopes along the Schuylkill River below Ivy Rock, in Montgomery County, again produced the same species.

My early experience with *Carex Muhlenbergii* and its allies was probably in no manner very different from other botanists not specialists in this genus—as the naming of material in any general collection amply shows. I had found that "*Muhlenbergii*" seemed to be the source of popular solution of all the odds and ends of plants of this group, unless the specimen was left unnamed, or possibly "*cephaloidea*" chosen. The chief characteristic of the latter seemed to be that the inflorescence was in a "head," while in the former it was elongated and the spikelets somewhat separated. I had found that the keys when made to work conclusively at all (commonly with both, or all, divisions used and the elimination method necessary) generally threw together plants which certainly did not form a thoroughly consistent series. Several years ago a student of *Carex* at whom I thrust our accumulation of puzzling *Muhlenbergianae* in the Herbarium of the Philadelphia Botanical Club, in endeavoring to associate the specimens with species known to him, was compelled, on my pressing him for opinions, to throw together plants which on examination showed in series a very palpable lack of homogeneity.

Under such circumstances the general botanist, everywhere, apparently, rather gives up in despair of naming such plants and waits for a more convenient season to work upon them or the coming of the specialist.

It was no small satisfaction to see Mr. Mackenzie take up this matter and find several well-marked new species in the *Muhlenbergianae.* When the opportunity arose to assist Mr. Mackenzie in gathering data on the regional distribution of various of our less well-known Carices in his work upon the *Carex* portion of Mr. Norman Taylor's Flora of the Vicinity of New York, a number of these puzzling *Muhlenbergianae* were brought forward with high hopes of an ultimate and satisfactory solution of their identity.

Some of these were only *Muhlenbergii,* a few *cephaloidea,* but several proved to be the little-known austral species *Carex aggregata,* which Mr. Mackenzie wrote me were the first specimens he had seen from north of Washington, D. C. With this authentically determined material and the original key* for this group in the new Illustrated Flora it was soon found that, especially in the *Muhlenbergianae* plant so long familiar to me, we had evidence of quite a well-distributed occurrence of this species through southeastern Pennsylvania, extending from the valley of the

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* The absence of bracts in *cephaloidea* (in contrast to their presence in *aggregata*) proves to be a weak character and one unsatisfactory for use in a key. The key in Taylor's Flora has been much improved over that in the new edition of the Illustrated Flora. The sheath and the scale characters are very distinctive.

Conestoga eastward for more than sixty miles to the valley of the Tacony—embracing the drainage of both the Susquehanna and the Delaware Rivers.

Since that time, besides several new stations near Philadelphia, a number of interesting occurrences of the species have been noted, some of considerable importance and representing range extensions of many miles northward.

May 27, 1914, the plant was found on the Coastal Plain of New Jersey. This was of notable interest as all the previously known localities in the Philadelphia region had been in the Piedmont area of southeastern Pennsylvania. Curiously enough I had been exploring the steep wooded slopes of Rancocas Creek in the vicinity of Vincentown, Burlington County, New Jersey, because of their already recognized richness in types more characteristic of the Pennsylvania uplands than the Atlantic Coastal Plain. Among numerous interesting discoveries there, was a colony of several large stools of *C. aggregata*—a species previously unknown in the state.

During a preliminary examination of the region in Berks County, Pennsylvania, selected for the 1915 joint Symposium of the Torrey and the Philadelphia Botanical Clubs, an important new station was found June 27 on the southerly edge of the Irish Mountains in the valley of Beaver Creek near Lobachsville. July 5 of the Symposium week at Fleetwood the plant was discovered just outside the village.*

Mr. Mackenzie, in explorations along the Delaware River, June 19 of the past season, extended the range of the species to Milford, Hunterdon County, New Jersey—the most northern station yet known. As at the two northern stations in Berks County, it is here also to be noted as rare.

The local distribution of the plant in the Philadelphia region makes it quite clear that this is an austral species pushing up the larger river valleys, on the northern edge of its range. In its occurrence well up the valley of the Schuylkill River toward the Blue Mountains, it is doubtless to be associated with the notable group of plants of austral affinity including the Papaw, the Red Bud, the Persimmon. It is probably to be classed among Carolinian types.

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* The long, very lax culms, additionally weighted by the spikes of mature fruit, were bent far over and many of the heads quite hidden among the grass and other vegetation. Experience has shown that this is a rather characteristic feature of the species. In this stage the plant often has the appearance of mere "grass" and may readily escape notice.

An apparent local center of abundance near Philadelphia, as shown by stations, is, I believe, quite illusory and due mainly to the more extensive work which has been carried on in this immediate vicinity. The several days of systematic exploration in the Fleetwood region of Berks County, coupled with a knowledge of the plant and its possibility there, demonstrated its occurrence in two localities.

It is of likely occurrence at least throughout southeastern Pennsylvania and immediately adjacent New Jersey, following well up the Delaware, as Mr. Mackenzie's station at Milford shows. In the southern portion of New Jersey it will probably be found to be closely confined to the richer soils along the streams of the Delaware system. No doubt were the lower Susquehanna valley as thoroughly explored as the lower Delaware, the plant would be shown to have a wider distribution there than only along the Conestoga.

The following stations in the Philadelphia area may be noted.

NEW JERSEY: Milford, Hunterdon County, June 19, 1915, *K. Mackenzie 6478;* Vincentown, Burlington County, May 27, 1914, *B. Long 9793.*

PENNSYLVANIA: Fleetwood, Berks County, July 5, 1915, *B. Long 12767;* Lobachsville, Berks County, June 27, 1915, *B. Long 12665;* Betzwood, Montgomery County, May 28, 1901, *Alex. MacElwes 2262;* Ivy Rock, Montgomery County, June 7, 1912, *B. Long 7329,* June 8, 1895, *J. Crawford;* "Rdg. RR. above Manyk. tunnel" [= West Manayunk, Montgomery County], 1865, *C. E. Smith;* Whitemarsh, Montgomery County, May 24, 1914, *B. Long 9760;* Ashbourne, Montgomery County, July 7, 1914, *B. Long 10194;* Robinson's Knoll [= Fairmount Park, Philadelphia], May 13, 1865, *C. E. Smith;* Wister's Meadow [= Germantown, Philadelphia], June, *W. Wister;* Fern Rock, Philadelphia County, June 19, 1909, *B. Long 975;* Darby Creek above West Chester Pike, Delaware County, June 2, 1912, *B. Long 7094;* Wawa, Delaware County, May 23, 1909, *F. W. Pennell 2072;* Frazer, Chester County, June 21, 1909, *B. Long 980;* Lancaster, Lancaster County, June 22, 1909, *B. Long 1033, 1034.*

Specimens of all these collections are in the Herbarium of the Philadelphia Botanical Club, with the exception of that from Milford, New Jersey, which, together with some of my own numbers, is in the herbarium of K. K. Mackenzie. A specimen of the Wawa collection is also to be found at the New York Botanical Garden. All the material cited has been critically examined by Mr. Mackenzie.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

IS FORESTRY A SCIENCE?

BY ROLAND M. HARPER

In an interesting paper entitled "Darwinism in forestry," in the American Naturalist for September, 1913, Raphael Zon discusses a few contributions to pure science that have been made by foresters, and makes this statement: "*Forestry as a science is nothing else but the study of the laws which govern the struggle for existence.*" Prof. Henry S. Graves, in an address made before the Washington Academy of Sciences on Dec. 3, 1914,* on "The place of forestry among natural sciences," expresses some of the same views as Zon, and also goes considerably farther in describing the contributions of foresters to science. He points out, as Zon did, that forests are the highest expression of plant life, and states that forestry is tree sociology, or the science of tree societies. He acknowledges the debt of foresters to taxonomists, physicists, chemists, geologists, soil investigators, pathologists, entomologists, etc., but mentions that Darwin's theory of evolution was anticipated by a writer on forestry, and that Warming, Schimper, and other pioneer

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* Printed in Journ. Wash. Acad. Sci. 5: 41–56. Jan. 19, 1915; Science II. 41: 117–127. Jan. 22, 1915; Monthly Weather Rev. 42: 671–672. Mar. 16, 1915 (abstract); and in Smithsonian Report for 1914. (in ed.)